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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------------------------------------------------------------|-------------|----------------------|---------------------|------------------|
| 10/615,287 | 07/07/2003 | Kunal R. Parekh | MI22-2260 | 8293 |
| 21567 | 7590 | 09/27/2004 | EXAMINER | |
| WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201 | | | TSAI, H JEY | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2812 | |

DATE MAILED: 09/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/615,287 | PAREKH ET AL. | |
| | Examiner | Art Unit | |
| | H.Jey Tsai | 2812 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-70 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-70 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 8-16, 22-28, 34-38, 44-70 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Jeng 6,177,695.

Jeng discloses a method of forming a DRAM device on the semiconductor substrate, which includes :

providing a semiconductor substrate having a memory array area and a peripheral circuitry area peripheral to the memory array area, the substrate comprising a first pair of word lines (gate electrode 22 on left hand side of figures) having a bit node received therebetween, the bit node being received within the memory array area, figs. 2a+ and col. 3, lines 36+,

commonly forming a bit node contact opening (left hand side of figures) within insulative material 31/32 over the bit node, a first peripheral contact opening (right hand side of figure, such as fig.2K, see col. 3, lines 50+) within insulative material 31/32 over a first node in the peripheral circuitry area, and a second peripheral contact opening within insulative material over a second node in the peripheral circuitry area,

forming sacrificial plugging oxide material 53/61 within the bit node contact opening having a bit line 51/52, the first peripheral contact opening and the second peripheral contact opening, col. 4, lines 25+,

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removing sacrificial plugging oxide material 61 from the bit node contact opening, the first peripheral contact opening and the second peripheral contact opening, and replacing it with conductive material 111 that is in electrical connection with the bit line and bit node 51/52, the first node and the second node, fig. 2j-2k and col. 5, lines 23+,

after the replacing, forming the conductive material 111 into a bit line 51/52 in electrical connection with the bit node (diffusion region of gate transistor) and into a local interconnect line 111/112 in the peripheral circuitry area electrically interconnecting the first and second nodes,

after forming the bit line 51/52, removing sacrificial plugging material 61 from the capacitor node contact opening. ss figs. 2f-2k.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-7, 17-21, 29-33 and 39-43 are rejected under 35 U.S.C 103 as being unpatentable over Jeng as applied to claims 1-3, 8-16, 22-28, 34-38, 44-70 above, and further in view of Kim 5,387,533.

The difference between the references applied above and the instant claim(s) is: Jeng teaches forming a bit line contact after replacing sacrificial oxide plug but does not

using conductive material as sacrificial plug. However, Kim teaches at col. 5, lines 25-36 that sacrificial plug material is metal or doped polysilicon layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above references' teachings by using conductive material such as metal or semiconductive material such as doped polysilicon layer as sacrificial plug as taught by Kim because conductive material has different etching selectivity from the insulative layer, so that the sacrificial plug can be easily removed.

Response to Arguments

Applicant's arguments filed July 14, 2004 have been fully considered but they are not persuasive. Applicants contends that material 51 of Jeng is doped silicon, material 52 is conductive, and material 53 is insulative. Further, material 21 of Jeng which caps its conductive word line portion 22 is electrically insulative silicon nitride. Col.5, Ins.22+ indicates that insulative oxide. However, Jeng clearly teaches removing of sacrificial plugging material from the bit node contact opening which is received between conductive portions of the pair of word lines, that is sacrificial plugging material formed between two conductive portions of word lines, even though some contact holes in figure 2d of Jeng shows sacrificial plugging material formed higher than conductive portion 22 but it is still between (not over) the conductive portions. In MPEP §2125, when the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. Further, Jeng teaches in fig. 2d, the layer 53 formed in the first contact hole from right hand side is lower than conductive portion 22.

In view of paper filed on July 14, 2004, the rejection of claims 1-12 and 47-50 under 35USC §102(b) over Kim and claims 1-70 are rejected under obviousness type double patenting over US patent no. 6,589,876 are withdrawn.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry of a general nature or clerical matters or relating to the status of this application or proceeding should be directed to the Group customer service whose telephone number is (703) 306-3329 and Fax number (703) 308-4357.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. Jey Tsai whose telephone number is (571) 272-1684. The examiner can normally be reached on from 7:00 Am to 4:00 Pm., Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (571) 272-1679. The fax phone number for this Group is (703) 872-9306.

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hjt

8/25/04

A handwritten signature in black ink, appearing to read 'H. Jey Tsai', is positioned above the printed name.

H. Jey Tsai
Primary Examiner
Patent Examining Group 2800